

What is claimed is:

1. A component-embedded board fabrication method for fabricating a component-embedded board with electronic components embedded within a wiring board, comprising:

5 a first detection step for detecting, before said board is covered with a first insulating layer, the actual position of a first electronic component formed on a surface of said board;

10 a first holding step for calculating a displacement between the design position of said first electronic component and the actual position of said first electronic component on the surface of said board, and for holding said displacement as first displacement data; and

15 a first correction step for correcting, based on said first displacement data, design data to be used for processing said board after said board is covered with said first insulating layer.

20 2. A component-embedded board fabrication method as claimed in claim 1, further comprising a first maskless exposure step for applying, based on said design data corrected in said first correction step, a maskless exposure to said board covered with said first insulating layer.

25 3. A component-embedded board fabrication method as claimed in claim 1, further comprising a first direct patterning step for forming, based on said design data corrected in said first correction step, a wiring pattern by inkjetting on said board covered with said first insulating layer.

30 4. A component-embedded board fabrication method as claimed in claim 1, further comprising a first via formation step for forming, based on said design data corrected in said first correction step, a via hole in said board covered with said first insulating layer.

35 5. A component-embedded board fabrication method

as claimed in claim 1, further comprising:

5 a second detection step for detecting, before said board is covered with a second insulating layer, the actual position of a second electronic component formed on a surface of said first insulating layer in which said first electronic component is already embedded;

10 a second holding step for calculating a displacement between the design position of said second electronic component and the actual position of said second electronic component on the surface of said first insulating layer, and for holding said displacement as second displacement data; and

15 a second correction step for correcting, based on said second displacement data, design data to be used for processing said board after said board is covered with said second insulating layer.

6. A component-embedded board fabrication method as claimed in claim 1, further comprising:

20 a first imaging step for capturing, before said board is covered with a second insulating layer, an image of a surface of said first insulating layer on which a second electronic component is formed and in which said first electronic component is already embedded;

25 a second holding step for calculating a displacement between the design position of said second electronic component and the actual position of said second electronic component detected from second image data obtained by imaging the surface of said first insulating layer, and for holding said displacement as second displacement data; and

30 a second correction step for correcting, based on said second displacement data, design data to be used for processing said board after said board is covered with said second insulating layer.

7. A component-embedded board fabrication method

as claimed in claim 5, further comprising a second maskless exposure step for applying, based on said design data corrected in said second correction step, a maskless exposure to said board covered with said second insulating layer.

5 8. A component-embedded board fabrication method as claimed in claim 6, further comprising a second maskless exposure step for applying, based on said design data corrected in said second correction step, a maskless exposure to said board covered with said second insulating layer.

10 9. A component-embedded board fabrication method as claimed in claim 5, further comprising a second direct patterning step for forming, based on said design data corrected in said second correction step, a wiring pattern by inkjetting on said board covered with said second insulating layer.

15 10. A component-embedded board fabrication method as claimed in claim 6, further comprising a second direct patterning step for forming, based on said design data corrected in said second correction step, a wiring pattern by inkjetting on said board covered with said second insulating layer.

20 11. A component-embedded board fabrication method as claimed in claim 5, further comprising a second via formation step for forming, based on said design data corrected in said second correction step, a via hole in said board covered with said second insulating layer.

25 12. A component-embedded board fabrication method as claimed in claim 6, further comprising a second via formation step for forming, based on said design data corrected in said second correction step, a via hole in said board covered with said second insulating layer.

30 13. A component-embedded board fabrication method as claimed in claim 1, wherein when the actual position of a terminal of said formed electronic component is displaced from an end of a wiring line that is defined in

5 said design data as being the end to be connected to the terminal of said electronic component, said first correction step corrects said design data so as to move said end of said wiring line to be connected to the terminal of said electronic component to the actual position of said formed electronic component.

10 14. A component-embedded board fabrication method as claimed in claim 1, wherein when the actual position of a terminal of said formed electronic component is displaced from the position specified by said design data and intersects with a wiring line used for connection to a terminal of another electronic component, said first correction step corrects said design data so as to move said wiring line away from the terminal of said other electronic component.

15 15. A component-embedded board fabrication method as claimed in claim 5, wherein when the actual position of a terminal of said formed electronic component is displaced from an end of a wiring line that is defined in said design data as being the end to be connected to the terminal of said electronic component, said second correction step corrects said design data so as to move said end of said wiring line to be connected to the terminal of said electronic component to the actual position of said formed electronic component.

20 16. A component-embedded board fabrication method as claimed in claim 5, wherein when the actual position of a terminal of said formed electronic component is displaced from the position specified by said design data and intersects with a wiring line used for connection to a terminal of another electronic component, said second correction step corrects said design data so as to move said wiring line away from the terminal of said other electronic component.

25 17. A component-embedded board fabrication method as claimed in claim 6, wherein when the actual position of a terminal of said formed electronic component is

displaced from an end of a wiring line that is defined in said design data as being the end to be connected to the terminal of said electronic component, said second correction step corrects said design data so as to move 5 said end of said wiring line to be connected to the terminal of said electronic component to the actual position of said formed electronic component.

18. A component-embedded board fabrication method as claimed in claim 6, wherein when the actual position 10 of a terminal of said formed electronic component is displaced from the position specified by said design data and intersects with a wiring line used for connection to a terminal of another electronic component, said second correction step corrects said design data so as to move 15 said wiring line away from the terminal of said other electronic component.

19. A component-embedded board fabrication method for fabricating a component-embedded board with 20 electronic components embedded within a wiring board, comprising:

a first imaging step for capturing, before said board is covered with a first insulating layer, an image of a surface of said board on which a first electronic component is formed;

25 a first holding step for calculating a displacement between the design position of said first electronic component and the actual position of said first electronic component detected from first image data obtained by imaging the surface of said board, and for holding said displacement as first displacement data; and 30

a first correction step for correcting, based on said first displacement data, design data to be used for processing said board after said board is covered with said first insulating layer.

35 20. A component-embedded board fabrication method as claimed in claim 19, further comprising a first maskless exposure step for applying, based on said design

data corrected in said first correction step, a maskless exposure to said board covered with said first insulating layer.

5 21. A component-embedded board fabrication method as claimed in claim 19, further comprising a first direct patterning step for forming, based on said design data corrected in said first correction step, a wiring pattern by inkjetting on said board covered with said first insulating layer.

10 22. A component-embedded board fabrication method as claimed in claim 19, further comprising a first via formation step for forming, based on said design data corrected in said first correction step, a via hole in said board covered with said first insulating layer.

15 23. A component-embedded board fabrication method as claimed in claim 19, further comprising:

a first detection step for detecting,
before said board is covered with a second insulating layer, the actual position of a second electronic component formed on a surface of said first insulating layer in which said first electronic component is already embedded;

25 a second holding step for calculating a displacement between the design position of said second electronic component and the actual position of said second electronic component on the surface of said first insulating layer, and for holding said displacement as second displacement data; and

30 a second correction step for correcting, based on said second displacement data, design data to be used for processing said board after said board is covered with said second insulating layer.

24. A component-embedded board fabrication method as claimed in claim 19, further comprising:

35 a second imaging step for capturing, before said board is covered with a second insulating layer, an image of a surface of said first insulating

layer on which a second electronic component is formed and in which said first electronic component is already embedded;

5 a second holding step for calculating a displacement between the design position of said second electronic component and the actual position of said second electronic component detected from second image data obtained by imaging the surface of said first insulating layer, and for holding said displacement as
10 second displacement data; and

15 a second correction step for correcting, based on said second displacement data, design data to be used for processing said board after said board is covered with said second insulating layer.

20 25. A component-embedded board fabrication method as claimed in claim 23, further comprising a second maskless exposure step for applying, based on said design data corrected in said second correction step, a maskless exposure to said board covered with said second insulating layer.

25 26. A component-embedded board fabrication method as claimed in claim 24, further comprising a second maskless exposure step for applying, based on said design data corrected in said second correction step, a maskless exposure to said board covered with said second insulating layer.

30 27. A component-embedded board fabrication method as claimed in claim 23, further comprising a second direct patterning step for forming, based on said design data corrected in said second correction step, a wiring pattern by inkjetting on said board covered with said second insulating layer.

35 28. A component-embedded board fabrication method as claimed in claim 24, further comprising a second direct patterning step for forming, based on said design data corrected in said second correction step, a wiring pattern by inkjetting on said board covered with said

second insulating layer.

5 29. A component-embedded board fabrication method as claimed in claim 23, further comprising a second via formation step for forming, based on said design data corrected in said second correction step, a via hole in said board covered with said second insulating layer.

10 30. A component-embedded board fabrication method as claimed in claim 24, further comprising a second via formation step for forming, based on said design data corrected in said second correction step, a via hole in said board covered with said second insulating layer.

15 31. A component-embedded board fabrication method as claimed in claim 19, wherein when the actual position of a terminal of said formed electronic component is displaced from an end of a wiring line that is defined in said design data as being the end to be connected to the terminal of said electronic component, said first correction step corrects said design data so as to move said end of said wiring line to be connected to the terminal of said electronic component to the actual position of said formed electronic component.

20 32. A component-embedded board fabrication method as claimed in claim 19, wherein when the actual position of a terminal of said formed electronic component is displaced from the position specified by said design data and intersects with a wiring line used for connection to a terminal of another electronic component, said first correction step corrects said design data so as to move said wiring line away from the terminal of said other electronic component.

25 33. A component-embedded board fabrication method as claimed in claim 23 wherein, when the actual position of a terminal of said formed electronic component is displaced from an end of a wiring line that is defined in said design data as being the end to be connected to the terminal of said electronic component, said second correction step corrects said design data so as to move

said end of said wiring line to be connected to the terminal of said electronic component to the actual position of said formed electronic component.

34. A component-embedded board fabrication method
5 as claimed in claim 23 wherein, when the actual position
of a terminal of said formed electronic component is
displaced from the position specified by said design data
and intersects with a wiring line used for connection to
a terminal of another electronic component, said second
10 correction step corrects said design data so as to move
said wiring line away from the terminal of said other
electronic component.

35. A component-embedded board fabrication method
as claimed in claim 24 wherein, when the actual position
15 of a terminal of said formed electronic component is
displaced from an end of a wiring line that is defined in
said design data as being the end to be connected to the
terminal of said electronic component, said second
correction step corrects said design data so as to move
20 said end of said wiring line to be connected to the
terminal of said electronic component to the actual
position of said formed electronic component.

36. A component-embedded board fabrication method
as claimed in claim 24 wherein, when the actual position
25 of a terminal of said formed electronic component is
displaced from the position specified by said design data
and intersects with a wiring line used for connection to
a terminal of another electronic component, said second
correction step corrects said design data so as to move
30 said wiring line away from the terminal of said other
electronic component.

37. A component-embedded board fabrication
apparatus for fabricating a component-embedded board with
electronic components embedded within a wiring board,
35 comprising:

a detecting unit for detecting, before
said board is covered with an insulating layer, the

actual position of an electronic component formed on a surface of said board;

5 a holding unit for calculating a displacement between the design position of said electronic component and the actual position of said electronic component on the surface of said board, and for holding said displacement as displacement data; and

10 a correcting unit for correcting, based on said displacement data, design data to be used for processing said board after said board is covered with said insulating layer.

15 38. A component-embedded board fabrication apparatus as claimed in claim 37, further comprising a maskless exposure unit for applying, based on said design data corrected by said correcting unit, a maskless exposure to said board covered with said insulating layer.

20 39. A component-embedded board fabrication apparatus as claimed in claim 37, further comprising a direct patterning unit for forming, based on said design data corrected by said correcting unit, a wiring pattern by inkjetting on said board covered with said insulating layer.

25 40. A component-embedded board fabrication apparatus as claimed in claim 37, further comprising via forming unit for forming, based on said design data corrected by said correcting unit, a via hole in said board covered with said insulating layer.

30 30 41. A component-embedded board fabrication apparatus as claimed in claim 37, wherein when the actual position of a terminal of said formed electronic component is displaced from an end of a wiring line that is defined in said design data as being the end to be connected to the terminal of said electronic component, said correcting unit corrects said design data so as to move said end of said wiring line to be connected to the terminal of said electronic component to the actual

position of said formed electronic component.

42. A component-embedded board fabrication apparatus as claimed in claim 37 wherein, when the actual position of a terminal of said formed electronic component is displaced from the position specified by said design data and intersects with a wiring line used for connection to a terminal of another electronic component, said correcting unit corrects said design data so as to move said wiring line away from the terminal of said other electronic component.

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43. A component-embedded board fabrication apparatus for fabricating a component-embedded board with electronic components embedded within a wiring board, comprising:

an imaging unit for capturing, before said board is covered with an insulating layer, an image of a surface of said board on which an electronic component is formed;

a holding unit for calculating a displacement between the design position of said electronic component and the actual position of said electronic component detected from image data obtained by imaging the surface of said board, and for holding said displacement as displacement data; and

a correcting unit for correcting, based on said displacement data, design data to be used for processing said board after said board is covered with said insulating layer.

44. A component-embedded board fabrication apparatus as claimed in claim 43, further comprising a maskless exposure unit for applying, based on said design data corrected by said correcting unit, a maskless exposure to said board covered with said insulating layer.

45. A component-embedded board fabrication apparatus as claimed in claim 43, further comprising a direct patterning unit for forming, based on said design

data corrected by said correcting unit, a wiring pattern by inkjetting on said board covered with said insulating layer.

46. A component-embedded board fabrication apparatus as claimed in claim 43, further comprising a via forming unit for forming, based on said design data corrected by said correcting unit, a via hole in said board covered with said insulating layer.

47. A component-embedded board fabrication apparatus as claimed in claim 43 wherein, when the actual position of a terminal of said formed electronic component is displaced from an end of a wiring line that is defined in said design data as being the end to be connected to the terminal of said electronic component, said correcting unit corrects said design data so as to move said end of said wiring line to be connected to the terminal of said electronic component to the actual position of said formed electronic component.

48. A component-embedded board fabrication apparatus as claimed in claim 43 wherein, when the actual position of a terminal of said formed electronic component is displaced from the position specified by said design data and intersects with a wiring line used for connection to a terminal of another electronic component, said correcting unit corrects said design data so as to move said wiring line away from the terminal of said other electronic component.